

What is claimed is:

1. A method for producing a composite nonwoven fabric in a vertical plane, comprising:

a) providing an extruder having a plurality of die heads, the extruder being located above a first chilled roller,

b) extruding heated continuous filaments from the die heads of the extruder to the first chilled roller, wherein the extruder is configured to provide the continuous filaments to the chilled roller in a canted direction that is tangent to the surface of the first chilled roller,

c) quenching and stretching simultaneously the continuous filaments,

d) conveying the continuous filaments in a downward direction to a nip comprising nip rollers,

e) providing at least one nonwoven web,

f) applying an adhesive on the surface of the one nonwoven web and then providing said one nonwoven web to the nip. and

g) laminating the continuous filaments with the nonwoven web in the nip to form a composite nonwoven fabric.

2. The method of claim 1 wherein the continuous filaments are elasticized.

3. The method of claim 1 wherein the composite nonwoven fabric is elasticized.

4. The method of claim 1 wherein the continuous filaments move vertically downward approximately in line with the lamination process.

5. The method of claim 1 wherein upon breakage of a continuous filament, the filament is automatically re-threaded.

6. The method of claim 1 comprising the further step of relaxing said composite nonwoven fabric by a take-up roll running at a differential speed.

7. The method of claim 1 comprising the further step of

03768/9379 (14590)

providing a second nonwoven web and laminating the second nonwoven web to the continuous filaments in the nip.

5 8. The method of claim 7 comprising the further step of applying an adhesive on the surface of the second nonwoven web prior to laminating the second nonwoven web at the nip.

9. The method of claim 1 wherein the conveying of the continuous filaments to the nip is accomplished via a series of sequential rollers.

10 10. The method of claim 9 wherein the number of sequential rollers is at least four.

11. The method of claim 10 wherein the rollers comprise a first chilled roller, a second chilled roller, a third roller, and a fourth roller.

15 12. The method of claim 1 wherein the speed ratio of the nip rolls relative to the first chilled roll can be varied.

13. The method of claim 12 wherein the speed ratio of the nip rolls relative to the first chilled roll is between about 2:1 and about 8:1.

20 14. The method of claim 12 wherein the speed ratio of the nip rolls relative to the first chilled roll is between about 4:1 and about 6:1.

15. The method of claim 1 wherein said quenching is accomplished with at least one additional temperature controlled chilled roller.

25 16. A method for producing a composite nonwoven fabric in a vertical plane, comprising:

30 a) vertically extruding heated continuous filaments from die heads of an extruder to a conveying roller located vertically lower than the extruder and wherein the extruder is configured to provide the continuous filaments to the conveying roller in a canted direction that is tangent to the surface of the conveying roller,

b) quenching and stretching simultaneously the continuous

03768/9379 (14590)

filaments,

c) conveying the continuous filaments in a downward direction to a nip comprising nip rollers,

d) providing at least one nonwoven web to the nip,

5 e) laminating the continuous filaments with the nonwoven web in the nip to form a composite nonwoven fabric, and

f) relaxing the composite nonwoven fabric.

17. The method of claim 16 wherein said conveying roller is chilled.

10 18. The method of claim 16 comprising the further step of providing a second nonwoven web to the nip and laminating the continuous filaments with the one nonwoven web and the second nonwoven web in the nip to form a composite nonwoven fabric.

15 19. The method of claim 16 wherein an adhesive is applied to the nonwoven web prior to providing the web to the nip.

20. The method of claim 19 wherein said adhesive is sprayed on said nonwoven web.

20 21. The method of claim 19 wherein an adhesive is applied to the second nonwoven web prior to providing the second nonwoven web to the nip.

22. An apparatus for producing a composite nonwoven fabric, comprising:

a) an extruder having a plurality of die heads for extruding heated continuous filaments,

25 b) a first conveying roller, the first conveying roller being positioned vertically with respect to the extruder so that the extruded heated continuous filaments are provided to the first conveying roller in a canted direction that is tangent to the surface of the first chilled roller,

30 c) a nip comprising at least two nip rollers, said nip being positioned vertically with respect to the first conveying roller in order to receive said heating continuous filaments,

03768/9379 (14590)

d) a roller mechanism for providing a first web to said nip to be laminated with the continuous filaments so as to form a continuous filament laminate, and

e) a mechanism for carrying the continuous filament laminate away from the nip.

23. The apparatus of claim 22 wherein said first conveying roller is temperature controlled.

24. The apparatus of claim 22 wherein said first conveying roller is a chilled roller.

25. The apparatus of claim 22 further comprising an adhesive applicator for applying adhesive to the first web prior to providing the first web to the nip.

26. The apparatus of claim 25 wherein the adhesive applicator applies the adhesive by spraying the adhesive onto the first web.

27. The apparatus of claim 22 further comprising a roller mechanism for providing a second web to said nip to be laminated with the continuous filaments and the first web so as to form a continuous filament laminate.

28. The apparatus of claim 25 further comprising an adhesive applicator for applying adhesive to the second web prior to providing the second web to the nip.

29. The apparatus of claim 28 wherein the adhesive applicator for the second web applies the adhesive by spraying the adhesive onto the second web.

03768/9379 (14590)